VIBRATING TAMPING BULL-FLOAT

FIELD OF THE INVENTION

This invention relates to the field of concrete working equipment, and more particularly to a vibrating tamping bull-float for smoothing the top surface of freshly poured concrete.

DISCUSSION OF PRIOR ART

In the concrete industry there are numerous methods for applying color and surface hardening additives to concrete. The color and hardener application method that is to be discussed herein is the topical application type that is applied after the freshly poured concrete has been roughly leveled to the desired elevation. The topical application method is performed by casting the color or hardener additive onto the top surface of the freshly poured concrete, then the color or hardener additives are worked into the top surface of the fresh concrete by pushing a bull-float or vibrating tamping bull-float such as U.S. patents 2,289,248 and 5,234,283 and 5,417,517 also patent #6,139,217 over the top of the fresh concrete surface. However this application method for the color additive type is notorious for having discolored chipped areas of cured/hard concrete, which become eyesores. This unsightly concrete is usually found around stamped concrete that has been placed at heavily traveled street intersections and sidewalks. The chipped areas are caused by heavy impact from hard objects. A devise that can be used during the bull-float process to allow the color additives to penetrate deeper at a uniform depth so as to not create discoloring (lightly colored areas) to the top surface of the freshly poured concrete, and without adding additional time to the normal working period of the bull-float user. This would be a highly desired item; additionally this device would benefit the hardener additive as well. The benefit lays in the deeper integration of the additives without extending the normal work period of the bull-float user. The prior art referred above is unable to penetrate the color additives deeper into the top surface and provide a consistent shade of color at the top surface of the freshly poured concrete without adding a considerable amount of time to the normal working period

OBJECTS

It is a primary object of the invention to increase the production of placing and finishing freshly poured concrete by eliminating the conventional method of tamping concrete by hand, thus reducing the physical time it takes to place and finish concrete. It also physically pushes coarse aggregate downward into the top surface of freshly poured concrete while cement cream migrates to the top surface such that a layer of equal or greater quantity of cement cream is deposited at the top surface of the freshly poured concrete, in comparison to the conventional method. It is a further object to level the concrete in a selected area more effectively by producing larger shockwaves/ripples and allowing them to be transmitted farther away from the vibrating tamping bull-float than other single float body vibrating bull-floats, such as U.S. patents 2,289,249 and 5,234,283 and 5,417,517 also 6,139,217. This helps the overall concrete surface area to become more level/flatter as the trailing edge 22 of the vibrating float body 3 moves across the surface of the freshly poured concrete. Another object of this present invention is to enable the user to conveniently turn the drive motor on or off.

SUMMARY OF THE INVENTION

These and other objects are accomplished by providing a vibrating tamping bull-float, which comprise of two float bodies. One of these is used as a stable float body. The other is used for a vibrating tamping float body that pushes coarse aggregate down into the top surface of freshly poured concrete while allowing cement cream to surface and a vibrating means mounted on the two-piece vibrating tamping bull-float body. The two-piece bull-float has a vibrating float body, which is pivotally attached to a stable float body. All of the float bodies are connected together by a hingeable means of attachment, which allows the vibrating float body to pivot from the stable float body while in vibrating mode. When the two-piece vibrating tamping bull-float is being pushed and pulled across freshly poured concrete surface, the vibrating float body physically tamps

the coarse aggregate down into the top surface of the freshly poured concrete while allowing cement cream to surface. This levels the concrete in the area surrounding the vibrating tamping bull-float body. This vibrating/tamping process will also benefit cement additive that are required to be integrated into the top surface of the freshly poured concrete. The benefit lays in the deeper integration of the additives.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be better understood and objects other than those set forth above will become apparent when consideration is given to the following detailed description thereof. Such description makes reference to the annexed drawings wherein:

FIG. 1 is a perspective view illustrating the preferred embodiment of the vibrating tamping bull-float constructed in accordance with the principles of the present invention.

FIG. 2 is an elevation view of side vibrating tamping bull-float shown in FIG 1.

FIG. 3 is a perspective view illustrating an alternate version of a three piece vibrating tamping bull-float body.

FIG. 4 is a section view of the alternate version of the three piece vibrating tamping bull-float body

FIG. 5 is a perspective view illustrating the alternate drive system for the vibrating tamping bull-float

FIG. 6 is a partially exploded view of the alternate drive system of the vibrating tamping bull-float in FIG.5

FIG. 7 is a perspective view of an assembled electrical switch mechanism/handle adapter

FIG. 8 is an exploded view of the electrical switch mechanism /handle adapter shown in FIG.7

DETIALED DESCRIPTION

FIG.1 is a perspective view of concrete vibrating tamping bull-float **1** in a primary embodiment of the present invention. Bull-float **1** has a rectangular two-piece body. The first piece is a stable float body **2** pivotally connected to the second piece vibrating body **3** by a continuous hinge **4** or by other means of hingable attachment. Electrical motor **5** is attached to the stable float body **2** by the motor mount **6**. A rechargeable battery **14** powers the electrical motor **5**. Battery **14** is held in place by a battery holding bracket **15**. Said battery bracket **15** is attached to the stable float body **2.** An electrical switch mechanism/handle adapter **16** regulates power from the battery **14**. A number of vinyl coated electrical copper wires **17** are connected to the battery **14**, electric motor **5**, and switch/handle adapter **16** in order to complete an electrical circuit. A bull-float handle attachment bracket **18** is connected to a stable float body frame **19**. A carriage bolt **20** or by other means of pivotal attachment connects the said handle bracket **18** to the switch/handle adapter **16**. The carriage bolt **20** is also used to adjust the switch/handle adapter **16** to the desired angle. The segmented handle **21** is attachable to the switch/handle adapter **16** and is also attachable to a duplicated segmented handle**21A**. **22** is a trailing edge of the vibrating float body **3**.

FIG.2 is a side elevational view of the bull-float **1** of FIG.1 showing drive shaft **7** of motor **5** supporting a cam lobe **8** at the end of the drive shaft **7**. The cam lobe **8** is pivotally connected to a connecting rod **9** by a cam stud **11** the connecting rod **9** has spherical bearings **10** at each end. The vibrating float body **3** is connected to the connecting rod **9** by a connecting rod mounting bracket **12** they are held together by a connecting pin **13.** Broken line **23** indicates vertical movement of a trailing edge while in vibrating/tamping mode.

FIG.3 is a perspective view of an alternative embodiment of the present invention wherein the three-piece float body **24** it is comprised of one stable float body **2** and two vibrating float bodies **3**. The longitudinal side, along each vibrating tamping float bodies are connected to the stable float body along both longitudinal narrow sides by strips of resilient material **25** or by other means of hingeable attachment. The vibrating tamping float bodies are held in a Simi-stable position by leaf-springs **26** there is an elongated hole **27** at each end of the leaf springs end there are round holes **27A** in FIG.4 that are used to allow bolts **28** to firmly attach the leaf-springs **26** to the stable float body frame **19**. A vibrating float body frame **29** is firmly attached to the vibrating float body **3**. A holding pin **30** is connected to the vibrating float frame **29**. A washer-bushing **31** in FIG.4 is positioned between the head of a holding pin **30** and the elongated hole **27** in FIG.4. The leaf-spring **26** is allowed to move freely between the washer-bushing **31** and the vibrating float frame **29**, The free movement of the leaf spring **26** allows the trailing edge **22** to move vertically **23** wile in vibrating mode and to return to Simi-stable position when out of vibrating mode. The two electric motors **5** that have eccentric weights **32** in fig.4 are attached at the end of the motors drive shaft **7**. The electric motors **5** are attached to the motor mounts **6**. The motor mounts are attached to each vibrating float body **3.** The electric motors **5** are powered by the rechargeable battery **14**.The battery **14** is held in place by the battery bracket **15**. The battery bracket **15** is attached to the stable float body **2**. The switch/handle adapter **16** regulates power from the battery **14**. The electrical wires **17** are connected to the battery **14**, electric motor **5**, and the switch /handle adapter **16** in order to complete an electrical circuit. The bull-float handle attachment bracket **18** is connected to the stable float body frame **19**. The carriage bolt **20** or by other means of pivotal attachment connects the handle bracket **18** to the switch/handle adapter**16**. The carriage bolt **20** is also used to adjust the switch/handle adapter **16** to the desired angle. The segmented handle **21** can be attachable to the switch/ handle adapter **16** and is also attachable to a duplicated segmented handle **21A**. **22** is the trailing edge of the vibrating float body **3**. **23** illustrate the vertical movement of the trailing edge while in vibrating mode.

FIG.4 is a sectional side view of bull-float **24** of FIG.3 showing the elongated hole **27** and the round hole **27A** in the leaf-spring. **31** is the washer-bushing. **32** is the eccentric weight that is attached to drive shaft.

FIG.5 is a perspective view illustrating the alternate drive system showing an elongated two-piece bull-float body **1.** The first piece is the stable float body **2** it is pivotally connected to the vibrating/tamping float body **3** by the continuous hinge **4** or by other means of hingable attachment. The battery powered drill motor **33** is firmly attached to a universal drill motor mount **34**.The drill motor mount **34** is attached to the stable float body **2**. A drive belt **35** is used to convey rotational energy from a chuck housing/drive Polly **36** to a shaft Polly **37**. A shaft **38** is held in place by three main bearings **39** they are inserted in a bearing housing **40**. The bearing housing **40** is attached to a main bearing/cantilever bracket **41**. The bearing bracket **41** is mounted to the stable float body **2**. One end of the connecting rod **9** is connected to crank end of the shaft **42**. The other end of the connecting rod **9** is connected to the connecting rod bracket **12**.

FIG.6 is a partially exploded view of the drive system of the bull-float in FIG.5 showing the switch/handle adapter **16** with a alternate throttle cable assembly **16A**. A throttle cable pin end **43** is held in place by a pin housing bracket **44**.The opposite end of the throttle cable **45** is attached to a trigger lever **46**. The said trigger lever **46** is connected to a adjustable trigger bracket **47** at a pivoting point **48** of the trigger lever **46**. One end of a cable housing **49** is attached to the said adjustable bracket **47** and is held in place by a cable housing holding bracket **50**.The opposite end of the cable housing **49** is connected to an axial-base mounting bracket **52** of the switch/handle adapter **16** and is also held in place by the housing bracket **50**.

FIG.7 is a perspective view of an assembled version of the electrical switch mechanism/handle adapter **16.**

FIG.8 is an exploded view of the electrical switching mechanism/handle adapter **16** of FIG.7 showing the pivoting hole **51** of the axial-mounting bracket **52**. The axial bracket **52** supports a spindle axial **53**. A Simi-locking bearing seating plate **54** is firmly attached to the axial bracket **52**. A handle adapter sleeve insert **55** is positioned in side a handle adapter sleeve **56** at a toggle switch/switching tab **57** end, and locked together. A Simi-locking bearing **59** and the tensioning spring **58** are housed in side said sleeve insert **55**. An electrical toggle switch **60** can be turned on or off as the switch tab **57** is rotated along with the handle adapter sleeve **56** to the desired Simi-locking position. A bushing washer **61** is positioned between the sleeve insert **55** and the tensioning nut **62.** The tensioning nut **62** is connected to the end of the spindle axial **53.**

The stable float body 2 helps prevent the vibrating tamping bull-float 1 in FIG.1 from submerging into freshly poured concrete while the vibrating float body 3 transmits larger shockwaves from the trailing edge 22. The tamping motion 23 of the vibrating float body 3 along the trailing edge 22 generates these shockwaves/ripples. This helps the overall concrete surface area to become more level/flatter as the trailing edge 22 of the vibrating float body 3 moves across the surface of the freshly poured concrete. This helps the user by reducing the amount of times they must repeat the vibrating tamping bull-floating cycle over the same path. This is caused by not leveling the concrete surface enough during the first cycle. A vibrating tamping bull-floating cycle is performed by turning on a means of vibration to the vibrating float body 3 while pushing the vibrating tamping bull-float 1 in FIG. 1 across the freshly poured concrete surface. A user would turn off the means of vibration to the vibrating float body 3 before returning in an ordinary bull-float method of floating. The trailing edge 22 moves up and down 23 when the two piece vibrating tamping bull-float is turned on, the up and down motion 23 in FIG. 2, also helps dry shake color hardeners to integrate deeper into the top surface of the freshly poured concrete, versus the conventional method of bull-floating with a single body vibrating bull-float. The stable float body 2 helps prevent the vibrating tamping bull-float 1 in FIG.1 from submerging into freshly poured concrete while the vibrating float body 3 transmits larger shockwaves from the trailing edge 22. The tamping motion 23 of the

vibrating float body 3 along the trailing edge 22 generates these shockwaves/ripples. by applying torsion pressure anywhere along the longitudinal axis of the segmented handle 21 or segmented handles without having to reach away from said handle or handles to turn the drive motor on or off. The torsion pressure is applied by the natural wrist movement of the operator during the vibrating tamping bull-float cycle, which is a desired feature.

A further discussion of various designs of the present invention that are not shown in the drawings, such as:

A two-piece float body comprising of two vibrating float bodies of equal width. These float bodies are arranged so that one would vibrate and the other vibrating float body would become a stable float body when not in use and vica-verca. Another design of the float bodies are arranged so that the vibrating float body moves vertically up and down in a level position (not pivoting) parallel to the stable float body.

The invention may be embodied and practiced in other specific forms without departing from the spirit and essential characteristics thereof. The present embodiments are therefore to be considered in all respects as illustrative and not restrictive. The scope of the invention being indicated by the appended claims rather than by the foregoing description; and all variations. Substitutions and changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein